

# CORDBLOOD ACRYLAMIDE LEVELS AND GENE EXPRESSION IN NEWBORN EXPOSED DURING PREGNANCY

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**Background and Aims:** Hemoglobin acrylamide adducts (HbAA) are biomarkers of exposure to acrylamide (AA). The highest AA concentrations are found in potato chips and french fries. Concerns about AA exposure *in utero* and the risk of adverse health effects are justified by AA potential carcinogenicity. Aim of this study was to investigate the association between exposure to AA in newborn during pregnancy and expression levels of 43 genes indicative of genotoxic and immunotoxic events.

**Methods:** The study included newborns from Greece, Norway, Spain, Denmark, and the United Kingdom (No=1151) whose mother gave informed consent at the time of recruitment in the EU funded Integrated Project NewGeneris (Newborns and Genotoxic exposure risks). HbAA were measured by the “adduct FIRE procedure” using LC-tandem mass spectrometry and gene expression by RT-PCR techniques. Mean ratios were computed to estimate the effect of each gene expression on HbAA level. The relationships between Hb-AA (log transformed) and genes expressions were investigated within each country by using the log-linear and in all newborns by fitting the mixed-effects linear regression model adjusting for selected covariates (child gender, ethnic group, gestational age, smoking during pregnancy). Multiple comparisons was accounted by the false discovery rate (FDR) correction and adjusted p-value < 0.05 were considered significant.

**Results:** Two genes were found to be associated with Hb-AA levels among newborns from all countries: HS00427977\_M1\_ERH\_GTX\_ITX (MR=0.79; 95%CI:0.71-0.89), and HS00925195\_M1\_PRKCA\_GTX (MR=0.93; 95%CI: 0.88-0.98). The association with the former gene was observed in newborns from UK (MR=0.70; 95% CI:0.57-0.87) and Spain (MR=0.66; 95% CI: 0.54-0.82) where some other genes showed a statistically significant relationship with Hb-AA. The analysis of newborns from Greece revealed a significant correlation between HS00925195\_M1\_PRKCA\_GTX (MR=0.91; 95%CI: 0.86-0.98) and Hb-AA. Further associations detected in other countries will be presented.

**Conclusions:** The results suggest that an increased expression of the above-mentioned genes, both involved in cell cycle regulation, is associated with a decreased level of Hb-AA in newborns possibly due to acrylamide exposure via maternal food intake during pregnancy.